

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. **(Currently Amended)** A computer-implemented method of detecting features on a semiconductor wafer comprising:

collecting data with a plurality of detectors that are positioned about the semiconductor wafer, wherein each detector collects one data frame for each of a plurality of device areas;

transmitting the data frames from each detector to a data distribution node, which is part of a set of data distribution nodes **that are interconnected with crossbar connections that enable data collected by any of the plurality of detectors to be transferred to any of the data distribution nodes;**

transferring a first data frame along a first data transfer path that connects a first and a second data distribution node **of the set of data distribution nodes;**

transferring a second data frame along a second data transfer path that connects the first and second data distribution nodes **of the set of data distribution nodes;**

routing the data frames from the data distribution nodes to processing nodes, wherein the transferring of data frames between data distribution nodes allows data from any one of the detectors to be routed to any one of the processing nodes;

processing the data frames within each of the processing nodes, wherein the processing within each processing node includes a **[[composite-]]**row based analysis that involves,

generating a plurality of first composite images, each of the first composite images being made up of **a row of [[each of the]]** data frames collected by one of the detectors, wherein each data frame **in the row** corresponds to a respective device area; and

comparing **[[each of]] data frames with** the first composite images in order to obtain defect information.

2. **(Previously Presented)** A computer-implemented method as recited in claim 1 wherein a number of data transfer paths equals the number of detectors that is used to collect data.

3. **(Original)** A computer-implemented method as recited in claim 1 further comprising:

buffering data frames within data distributor buffers within each data distribution node.

4. **(Original)** A computer-implemented method as recited in claim 1 wherein each detector collects data for each of three or more device areas.

5. **(Cancelled)**

6. **(Previously Presented)** A computer-implemented method as recited in claim 1 wherein the processing of data further comprises a composite-column based analysis that involves,  
generating a second composite image for each device area by combining the data frames collected by each detector corresponding to a specific device area; and  
comparing each of the second composite images in order to obtain defect information.

7. **(Original)** A computer-implemented method as recited in claim 6 wherein the processing of data further comprises a row based analysis involving,  
for each detector, comparing the data frames collected for each of the plurality of device areas, wherein there are four or more device areas.

8. **(Previously Presented)** A computer-implemented method as recited in claim 7 wherein the processing of data further comprises a column based analysis involving,  
comparing the data frames collected by each detector for one of the device areas.

9-10. **(Cancelled)**

11. **(Currently Amended)** A computer-implemented method as recited in claim 6 **[[10]]** wherein the processing of data further comprises a row based analysis involving,  
for each detector, comparing the data frames collected for each of the plurality of device areas, wherein there are four or more device areas.

12. **(Previously Presented)** A computer-implemented method as recited in claim 11 wherein the processing of data further comprises a column based analysis involving,  
comparing the data frames collected by each detector for one of the device areas.

13. **(Currently Amended)** A semiconductor wafer inspection system comprising:

- a semiconductor wafer having a plurality of device areas;
- a plurality of detectors positioned about a semiconductor wafer wherein each detector is configured to collect a data frame for each of the plurality of device areas;
- a data distribution system that includes a plurality of data distribution nodes, at least one of the data distribution nodes configured to receive data frames from the detectors;
- a plurality of data transfer paths connecting each of the data distribution nodes wherein at least some of the data transfer paths include crossbar connections between the data distribution nodes that enable data collected by any of the plurality of detectors to be transferred to any of the data distribution nodes and wherein each data transfer path transfers data frames collected by a respective detector;
- a plurality of processing nodes configured to receive data frames from the data distribution system, the processing nodes configured to analyze the data frames, wherein the data transfer paths allow data frames collected by any one of the detectors to be routed to any one of the processing nodes;
- wherein each of the processing nodes are configured to perform a ~~[[composite-]]~~row based analysis that involves,
  - generating a plurality of first composite images, each of the first composite images being made up of each of the data frames collected by one of the detectors, wherein each data frame corresponds to a respective device area; and
  - comparing each of the first composite images in order to obtain defect information.

14. **(Original)** A semiconductor wafer inspection system as recited in claim 13 wherein each data distribution node includes a data buffer for data frames collected by each of the detectors.

15. **(Original)** A semiconductor wafer inspection system as recited in claim 13 wherein each detector is configured to collect data from three or more device areas.

16. **(Cancelled)**

17. **(Currently Amended)** A semiconductor wafer inspection system as recited in claim 13 ~~[[16]]~~ wherein each of the processing nodes are further configured to perform a composite-column based analysis that involves,

generating a second composite image for each device area by combining the data frames collected by each detector corresponding to a specific device area; and

comparing each of the second composite images in order to obtain defect information.

18. **(Original)** A semiconductor wafer inspection system as recited in claim 17 wherein each of the processing node are further configured to perform a row based analysis involving,

for each detector, comparing the data frames collected for each of the plurality of device areas, wherein there are four or more device areas.

19. **(Previously Presented)** A semiconductor wafer inspection system as recited in claim 18 wherein each of the processing nodes are further configured to perform a column based analysis involving,

comparing the data frames collected by each detector for one of the device areas.